Message

From: Cournoyer, Patrick [Patrick.Cournoyer@fda.hhs.gov]
Sent: 6/23/2017 3:16:44 PM
To: Al Khaldi, Sufian [Sufian.AlKhaldi@fda.hhs.gov]; Alewynse, Michaela G [Mika.Alewynse@fda.hhs.gov]; Baker, Jeffrey [Jeffrey.Baker@fda.hhs.gov]; Blumkemelor, Donna [Donna.Blumkemelor@fda.hhs.gov]; Bonnette, Richard [Richard.Bonnette@fda.hhs.gov]; Bouri, Khaled [Khaled.Bouri@fda.hhs.gov]; Carlson, Susan [Susan.Carlson@fda.hhs.gov]; Tracy Chen [tracy.chen@fda.hhs.gov]; Choudhuri, Supratim [Supratim.Choudhuri@fda.hhs.gov]; Christensen, Rial [Rial.Christensen@fda.hhs.gov]; Dietz, Jason [Jason.Dietz@fda.hhs.gov]; Ditto, Mary D [Mary.Ditto@fda.hhs.gov]; Edwards, David [David.Edwards@fda.hhs.gov]; Epstein, Laura [Laura.Epstein@fda.hhs.gov]; Etkins, Jeanne [Jeanne.Etkins@fda.hhs.gov]; Fasano, Jeremiah [Jeremiah.Fasano@fda.hhs.gov]; Flamm, Eric [Eric.Flamm@fda.hhs.gov]; Hatwell, Karen [Karen.Hatwell@fda.hhs.gov]; Heintz, Kasey [Kasey.Heintz@fda.hhs.gov]; Jones, Kathleen [Kathleen.Jones@fda.hhs.gov]; Kahl, Linda S [Linda.Kahl@fda.hhs.gov]; Kaneko, Kotaro [Kotaro.Kaneko@fda.hhs.gov]; Keefe, Dennis M [Dennis.Keefe@fda.hhs.gov]; Kotewicz, Michael L [Michael.Kotewicz@fda.hhs.gov]; Krause, Andrea [Andrea.Krause@fda.hhs.gov]; Lacana, Emanuela [Emanuela.Lacana@fda.hhs.gov]; Linden, Carol [Carol.Linden@fda.hhs.gov]; Manseur, Amal [Amal.Manseur@fda.hhs.gov]; Mattia, Antonia [Antonia.Mattia@fda.hhs.gov]; McMahon, Carrie [Carrie.McMahon@fda.hhs.gov]; Mendrick, Donna [Donna.Mendrick@fda.hhs.gov]; Merker, Robert I [Robert.Merker@fda.hhs.gov]; Morgan, Michael [Michael.Morgan@fda.hhs.gov]; Mukherjee, Amit [Amit.Mukherjee@fda.hhs.gov]; Nalubola, Ritu [Ritu.Nalubola@fda.hhs.gov]; Ostroff, Stephen [Stephen.Ostroff@fda.hhs.gov]; Pillsbury, Laura [Laura.Pillsbury@fda.hhs.gov]; Read, Jeffrey [Jeffrey.Read@fda.hhs.gov]; Ronnenberg, William [William.Ronnenberg@fda.hhs.gov]; Rose, Diane [Diane.Rose@fda.hhs.gov]; Rosenfeld, Leah [Leah.Rosenfeld@fda.hhs.gov]; Rudenko, Larisa [Larisa.Rudenko@fda.hhs.gov]; Shah, Romina [Romina.Shah@fda.hhs.gov]; Shaheed, Shaila [Shaila.Shaheed@fda.hhs.gov]; Shapiro, Martin [Martin.Shapiro@fda.hhs.gov]; Solomon, Shari [Shari.Solomon@fda.hhs.gov]; Srinivasan, Jannavi [Jannavi.Srinivasan@fda.hhs.gov]; Thomas, Audrey A [Audrey.Thomas@fda.hhs.gov]; Wafula, Denis [Denis.Wafula@fda.hhs.gov]; Weichold, Frank [Frank.Weichold@fda.hhs.gov]; Wilson, Carolyn [Carolyn.Wilson@fda.hhs.gov]; Zhu, Jianmei [Jianmei.Zhu@fda.hhs.gov]
Subject: GE News & Science

NEWS

EPA authorizes first crop with pesticidal RNA

- EPA registered GE corn varieties expressing double stranded RNA targeting corn rootworm

EPA: News Release EPA Registers Innovative Tool to Control Corn Rootworm
EPA: Pesticide Registration: EPA Registers Innovative Tool to Control Corn Rootworm

Cayman Islands approve island-wide use of Oxitec GE mosquitoes

- "The National Conservation Council on Wednesday unanimously approved the islandwide rollout… without the need for a new independent risk assessment."
- "Department of Environment officials advised that international risk assessments conducted in trials in Brazil, Malaysia, and the U.S. provided sufficient confidence…"
- Officials say the trial was successful in West Bay

Cayman Compass: Islandwide GM mosquito release approved

EFSA publishes new guidance for allergenicity assessment of GE plants

EFSA: Assessing allergenicity of GM plants: new EFSA guidance provides advice

German plant breeders release "open source" plant varieties

- Normally, plant varieties can be protected by patents, which can prevent use by other breeders
- The German varieties have legally binding restrictions on patenting future varieties bred from these

Science: German breeders develop 'open-source' plant seeds

***Business Insider* features GE papaya story**
Business Insider: This Cornell scientist saved an $11-million industry — and ignited the GMO wars

COMMENTARY

New York Times* praises new film in support of "GMOs," *Food Evolution
New York Times: Review: In 'Food Evolution,' Scientists Strike Back

***Epoch Times* claims genome edited crops are on the market and consumers are not informed of risks**

- The article states 5% of US canola is genome edited, SU canola from Cibus
- "This off-target effect can introduce undesired changes in sequences of the genome with unpredictable consequences for cells, organs, organisms, and even environments."
- The article also quotes scientists explaining that off-target effects from genome editing in plants are rare and not generally harmful
- The executive director of the Non-GMO Project said, "GMOs, including the products of these new technologies, have not been adequately tested—no long-term feeding studies have been conducted."

Epoch Times: Consumers Remain in the Dark About Potential Risks of New GMO Techniques

SCIENCE

CRISPR/Cas9 used to suppress transcription factors that boost biofuel lipid production in the industrial microalga *Nannochloropsis gaditana*

- The authors used CRISPR/Cas9 to make targeted mutations in several transcription factors associated with lipid production
- Normally the alga only produces large quantities of liquid under N starvation, which limits growth
- The new strain produces twice as much lipids under continuous growth than wild type, making it better suited for biofuel production

Nature Biotechnology: Lipid production in *Nannochloropsis gaditana* is doubled by decreasing expression of a single transcriptional regulator
San Diego Union-Tribune: Synthetic Genomics and ExxonMobil double biofuel yield from algae

Camelina accumulating omega-3 fatty acids is a suitable substitute for fish oil in aquaculture of Gilthead Sea Bream

- The GE camelina plants express a Δ6-desaturase from *Ostreococcus tauri*, a Δ6 fatty acid elongase from *Physcomitrella patens*, a Δ5-desaturase from *Thraustochytrium sp.*, a Δ12-desaturase from *Phytophthora sojae*, and a ω3-desaturase from *Phytophthora infestans*
- The GE camelina is undergoing field trials in the UK

Lipids: Replacement of Marine Fish Oil with de novo Omega-3 Oils from Transgenic Camelina sativa in Feeds for Gilthead Sea Bream (Sparus aurata L.)

Glyphosate tolerant rice developed in China

- The rice expresses EPSPS from *Pseudomonas fluorescens*

Frontiers in Plant Science: Development and Event-specific Detection of Transgenic Glyphosate-resistant Rice Expressing the G2-EPSPS Gene

Rice expressing the *Arabidopsis* resistance gene *RPW8.1* has enhanced resistance to multiple pathogens
Plant Biotechnology Journal: RESISTANCE TO POWDERY MILDEW8.1 boosts pattern-triggered immunity against multiple pathogens in Arabidopsis and rice

CRISPR/Cas9 used to enhance levels of gamma-aminobutyric acid (GABA) in tomato
Plant Biotechnology Journal: Multiplexed CRISPR/Cas9-mediated Metabolic Engineering of γ-Aminobutyric Acid Levels in Solanum lycopersicum

Tomato overexpressing the *Arabidopsis* gene JUNGBRUNNEN1 has improved drought tolerance
Plant Biotechnology Journal: NAC transcription factor JUNGBRUNNEN1 enhances drought tolerance in tomato

Peas engineered for fungal resistance do not adversely affect mycorrhizal fungi

- The peas express 1-3 β glucanase, endochitinase, polygalacturonase-inhibiting proteins, and stilbene synthase, singly or in combination
- Field trials for efficacy are ongoing in Canada

Mycorrhiza: Antifungal genes expressed in transgenic pea (Pisum sativum L.) do not affect root colonization of arbuscular mycorrhizae fungi

Sweetpotato overexpressing endogenous dehydration-responsive element-binding/C-repeat-binding factor (DREB/CBF) has enhanced tolerance to abiotic stresss

- The stresses include cold, drought, and oxidative stress

Plant Physiology and Biochemistry: Overexpressing IbCBF3 increases low temperature and drought stress tolerance in transgenic sweetpotato

Rice expressing a glucan water dikinases (GWD1) from potato has highly phosphorylated starch

- Phosphorylated starch is desirable for certain industrial approaches

Scientific Reports: Highly phosphorylated functionalized rice starch produced by transgenic rice expressing the potato GWD1 gene

Cotton expressing double stranded RNA targeting plant bug (*Adelphocoris suturalis*) fatty acyl-coenzyme A reductase has improved resistance

- Sap sucking plant bugs have emerged as important secondary pests on Bt cotton

New Phytologist: A transgenic strategy for controlling plant bugs (*Adelphocoris suturalis*) through expression of double-stranded RNA homologous to fatty acyl-coenzyme A reductase in cotton

Study finds high susceptibility in soybean looper to Cry1Ac in Brazil
Pest Management Science: High susceptibility and low resistance allele frequency of *Chrysodeixis includens* (Lepidoptera: Noctuidae) field populations to Cry1Ac in Brazil

Toxicological study with Wuzhishan miniature pigs fed corn containing Cry1Ac finds no diet-related adverse effects
Journal of the Science of Food and Agriculture: Long-term toxicity study on genetically modified corn with cry1Ac gene in a Wuzhishan miniature pig model

Perilla overexpressing tocopherol methyltransferase has improved oil quality
Plant Physiology and Biochemistry: Assessment of the phenolic profile, antimicrobial activity and oxidative stability of transgenic Perilla frutescens L.overexpressing tocopherol methyltransferase (γ-tmt) gene

The Africa Harvest Biotech Foundation explains the foundations for its success in community engagement to build trust and promote technology adoption

- The foundation explains how it promoted adoption of tissue-culture banana in Kenya

BMC Biotechnology: The role of community engagement in the adoption of new agricultural biotechnologies by farmers: the case of the Africa harvest tissue-culture banana in Kenya

---

Patrick Cournoyer, Ph.D.
Consumer Safety Officer

Center for Food Safety and Applied Nutrition
Office of Food Additive Safety
U.S. Food and Drug Administration
Tel: 240-402-1019
patrick.cournoyer@fda.hhs.gov